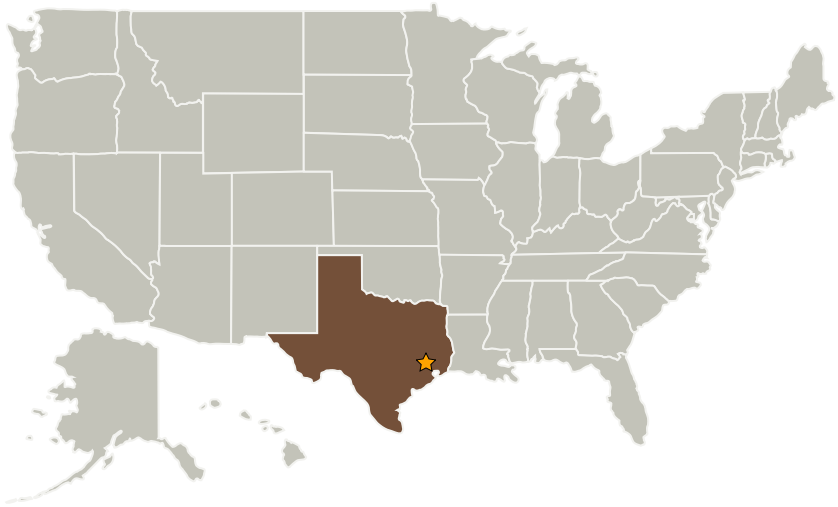
Novel Regenerative Carbon Analyzer for Water Quality Monitoring, Phase II

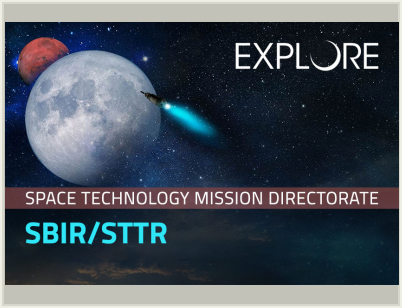
Completed Technology Project (2005 - 2007)

Project Introduction

One of the highest priorities of a regenerative life support system for manned space missions (to the Moon, Mars, and other remote locations) is to recover and process wastewater to provide clean water. Among detectors used to monitor recycled water quality, a total organic carbon (TOC) instrument must be used to assess the organic contaminant level. Available TOC instruments have major limitations for space missions: they need periodic resupply of reagents and water; thus, storage of toxic chemicals and crew time for maintenance are required. The aim of this project is to develop a novel Total Organic Carbon Analyzer (TOCA) for real-time monitoring of water quality. It will be designed with an operational lifetime of 5 years with no maintenance required and no need to supply reagents or water. During the Phase I, Lynntech designed, fabricated, and successfully tested both critical components of TOCA and a breadboard TOCA. Testing included ersatz reverse osmosis permeate water. Requirements for TOC range (0.25 to 50 ppm) and accuracy (? 25% above 1 ppm and ?0.25 ppm below 1 ppm) were met. During Phase II, an optimized, precise, reliable, flight qualifiable, microgravity compatible TOCA prototype will be designed, fabricated, tested, and delivered to NASA.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Lynntech, Inc.	Supporting Organization	Industry	College Station, Texas

Primary U.S. Work Locations
Texas

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.1 Environmental Control & Life Support Systems (ECLSS) and Habitation Systems
    - TX06.1.2 Water Recovery and Management